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10/584,687	04/19/2007	Claes-Goran Johansson	AWEK 3.3-001	7362

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HAVAN, HUNG T	
ART UNIT	**PAPER NUMBER**
2128	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,687	JOHANSSON ET AL.	
	Examiner	Art Unit	
	HUNG HAVAN	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendments

Claim Status

1. In the amendments filed 07/30/2010, the following occurred: Claims 1-7 were amended. Claims 8-10 were canceled. Claim 11 was added. Claims 1-7 and 11 are currently pending in Instant Application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being **indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 11, the instant claim recites "model attenuating elements" which is unclear. What element would "attenuate" a model? Similarly, the instant claim recites "model single attenuating device". It is unclear what is "a model single attenuating device".

3. The above cited rejections are merely exemplary.
4. The Applicant(s) are respectfully requested to correct all similar errors.
5. Claims not specifically mentioned are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***"A Study of the Noise From Diesel Engines Using the Independent Component Analysis" by Li et al (hereinafter as Li)*** in view of ***Johansson et al (US Pat. No. 6,167984 B1)(hereinafter as Johansson)*** further in view of ***Galaitsis (US Pat. No. 6,454,047)***.

Li discloses: As per claim 1 (currently amended), a method for supplying a system for sound attenuation of noise relating to an exhaust system of exhaust gases from a high power combustion engine, the method comprising:

adding to a model of the exhaust system, by means of a computing device **(i.e. page 1172, § 4. Numerical Study, ¶ 2 of section, lines 1-2, teaches simulated source signal which necessitate a computing device)**, a plurality of elements **(i.e. Fig. 2 and page 1167, § 2.2. The Intake and Exhaust Noise, ¶ 1, lines 1-2, teaches intake and exhaust systems can be modeled using the pressure source as shown in Fig. 2);**

inserting into the model, by means of the computing device **(i.e. page 1172, § 4. Numerical Study, ¶ 2 of section, lines 1-2, teaches simulated source signal which necessitate a computing device)**, at least one single attenuating device **(i.e. page 1167, § 2.2. The Intake and Exhaust Noise, ¶ 2, line 3, teaches acoustial load (muffler).)**;

calculating, by means of the computing device **(i.e. page 1172, § 4. Numerical Study, ¶ 2 of section, lines 1-2, teaches simulated source signal which necessitate a computing device)**, an attenuating effect of the elements and an attenuating effect of the at least one single attenuating device relating to a sound pressure level of the high power combustion engine **(i.e. page 1175, § 5.1 Engine Noise Characteristics, ¶ 4 of section, lines 1-6, teaches comparison result of the normalized kurtosis between the simulated Gaussian distributions and the measure acoustic signals.)**;

repeating the inserting and calculating step **(i.e. page 1175, § 5.1 Engine Noise Characteristics, ¶ 4 of section, lines 1-7, teaches the acoustic signals are measured from the test engine under different speed and load conditions with a total of 160 measurements.)**

Although Li teaches a plurality of elements, Li does not expressly disclose the plurality of elements where each element comprises a first reactive part, a resistive part and a second reactive part; and at least one single attenuating device mounted as channel parts along the exhaust system.

Johansson, however, discloses where each element comprises a first reactive part, a resistive part and a second reactive part **(Fig. 1 and col. 5, lines 23-24)**; and at least one single attenuating device mounted as channel parts along the exhaust system **(col. 8, lines 22-24, teaches channel**

15 arranged on the inside of the container is to permit the passage of a partial amount of the hot exhaust gases flowing through the sound attenuator).

Li and Johansson et al are analogous art because they are from similar field of endeavor of sound reduction in a transport system. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the attributes of the transport system for gas composed of resistive and reactive attenuators discussed by Johansson in the independent component analysis model discussed by Li for the purpose of producing a transport system for gas from which the sound emission is less than from conventionally known systems **(Johansson et al: col. 3, lines 35-37)**.

Li and Johansson do not expressly disclose the sound pressure level of the high power combustion engine is attenuated below a predetermined level; and assembling the system for sound attenuation, wherein a measured noise level at the close vicinity of an outlet is below the predetermined noise level.

Galaitsis, however, discloses the sound pressure level of the high power combustion engine is attenuated below a predetermined level **(col. 4, lines 4-9 and col. 5, lines 56-65, teaches noise from the engine are selectively accumulated and confined in at least one accumulator, for a time sufficient to attenuate the exhaust noise by ringdown. Galaitsis teaches "ringdown" means the process by which noise (acoustic energy) effectively confined within a defined volume, such as an accumulator, naturally decays over time. Col. 6, lines 58-61, teaches most preferably $T_{ringdown}$ is sufficient to substantially eliminate the noise by ringdown.)**; and assembling the system for sound attenuation, wherein a measured noise level at the close vicinity of an outlet is below the predetermined noise level **(col. 3, lines 14-26, teaches noise attenuator**

including a plurality of accumulators arranged in series and collectively providing a transmittance path for compressible flow mass and noise … thereby attenuating exhaust noise within the at least one accumulator by ringdown.).

Li, Johansson, and Galaitsis are analogous art because they are from similar field of endeavor of sound reduction in a transport system. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the attributes of the transport system for gas composed of resistive and reactive attenuators discussed by Johansson with the principle of arranging attenuator to achieve ringdown as discussed by Galaitsis in combination with the independent component analysis model discussed by for the purpose of analyzing an improved system for attenuating noise where the length of time the sound waves take to propagate through the length of the transmittance path is not a factor **(Galaitsis: col. 2, lines 37-46)**.

Li discloses: As per claim 2 (currently amended), a method according to claim 1, wherein calculating the attenuation effect of the elements further comprises calculating an attenuation effect for a band of frequencies corresponding to intermediate frequencies for one or more of the elements **(i.e. page 1167, § 2.1 The combustion and Mechanical Induced Noise, ¶ 5 of section, lines 1-7 and Fig 5, teaches separation of sound frequencies.)**.

Li discloses: As per claim 3 (currently amended), a method according to claim 2, wherein calculating the attenuation effect for the band of frequencies corresponding to the intermediate frequencies for one or more of the elements further comprises calculating the attenuation effect for the band of frequencies using four-pole theory and power flow models **(Fig. 2 and page**

1168, § 2.2. The Intake and Exhaust Noise, ¶ 2, lines 4-5, teaches a model based on four-pole theory where the four-pole coefficients A, B, C and D represent the transfer characteristics of the muffler (i.e. attenuation effect contributed of the muffler)).

Johansson discloses: As per claim 4 (currently amended), a method according to claim 1 or 3 wherein the at least one single reactive attenuating device is positioned at an odd number of a quarter of a wavelength from a distinct impedance **(col. 4, lines 48-55, teaches to obtain a good attenuating effect at a certain frequency of the sound, a quarter-wave attenuator is thus to be placed with its orifice in a position which is a quarter of a wavelength away from the area increase)**, and wherein the wavelength is the single attenuating device's tuned frequency **(col. 6, lines 15-27, teaches quarter-wave attenuator. See also col. 7, lines 13-24, teaches the reactive attenuator is adapted to be tuned such as to a lower limit frequency of the frequency band.)**.

Li discloses: As per claim 5. (currently amended), a method according to claim 4, further comprising calculating a pressure drop along the exhaust system **(i.e. § 2.2. The Intake and Exhaust Noise, ¶ 3, lines 1-4, teaches propagation of the source pressure can be calculated)**.

Johansson discloses: As per claim 6 (currently amended), a method according to 1, wherein the minimum length of the exhaust system is 8 meters, and wherein the effect of the combustion engine is greater than 500 kW **(col. 5, lines 30-37, teaches exhaust system for a diesel engine on a ship)**.

Johansson discloses: As per claim 7 (currently amended), a method according to claim 6 where the exhaust system comprises a heat exchanger or boiler **(col. 3, lines 44-46, teaches system comprising exhaust gas boiler)**, which reduces the temperature of the exhaust gas in the exhaust system and therefore the wavelength of the sound decreases after the heat exchanger or boiler **(col. 8, lines 22-33)**, and the at least one single attenuating device is positioned in an odd number of a quarter of the wavelength from the outlet of the heat exchanger or boiler**(col. 4, lines 48-55, teaches to obtain a good attenuating effect at a certain frequency of the sound, a quarter-wave attenuator is thus to be placed with its orifice in a position which is a quarter of a wavelength away from the area increase)**, and where the wavelength is the single attenuating device's tuned frequency **(col. 6, lines 15-27, teaches quarter-wave attenuator. See also col. 7, lines 13-24, teaches the reactive attenuator is adapted to be tuned such as to a lower limite frequency of the frequency band.)** .

Li discloses: As per claim 11 (new), a system for attenuating noise in an exhaust system of a high power combustion engine, the system comprising:

> adding, in a computerized model of the exhaust system by means of a program executed by a processor **(i.e. page 1172, § 4. Numerical Study, ¶ 2 of section, lines 1-2, teaches simulated source signal which necessitate a computing device)**, a plurality of elements **(i.e. Fig. 2 and page 1167, § 2.2. The Intake and Exhaust Noise, ¶ 1, lines 1-2, teaches intake and exhaust systems can be modeled using the pressure source as shown in Fig. 2)**;

inserting, into the computerized model of the exhaust system by means of the program **(i.e. page 1172, § 4. Numerical Study, ¶ 2 of section, lines 1-2, teaches simulated source signal which necessitate a computing device)**, a single attenuating device representing one of the number of single attenuating devices **(i.e. page 1167, § 2.2. The Intake and Exhaust Noise, ¶ 2, line 3, teaches acoustial load (muffler).)**;;

calculating, with the processor **(i.e. page 1172, § 4. Numerical Study, ¶ 2 of section, lines 1-2, teaches simulated source signal which necessitate a computing device)** an estimated sound pressure level at a first location in the model exhaust system based upon an attenuation effect due to the addition of the plurality of model attenuating elements and the insertion of the model single attenuating device into the model exhaust system **(Fig. 2 and page 1168, § 2.2. The Intake and Exhaust Noise, ¶ 2, lines 4-5, teaches a model based on four-pole theory where the four-pole coefficients A, B, C and D represent the transfer characteristics of the muffler (i.e. attenuation effect contributed of the muffler)**; and

repeating the inserting and calculating step **(i.e. page 1175, § 5.1 Engine Noise Characteristics, ¶ 4 of section, lines 1-7, teaches the acoustic signals are measured from the test engine under different speed and load conditions with a total of 160 measurements.)**.

Li does not expressly disclose a first number of single attenuating devices and a second number of attenuating elements, where each attenuating element further comprises a first reactive part, a resistive part and a second reactive part, and

the first number of attenuating devices and the second number of attenuating elements are arranged in a channel of the exhaust system such that a measured noise level at an outlet of the channel is attenuated below a predetermined noise level; and,

wherein the first number of attenuating devices and the second number of attenuating elements are determined and arranged in the exhaust system.

Johansson, however, discloses a first number of single attenuating devices and a second number of attenuating elements, where each attenuating element further comprises a first reactive part, a resistive part and a second reactive part **(Fig. 1 and col. 5, lines 23-24)**;, and

the first number of attenuating devices and the second number of attenuating elements are arranged in a channel of the exhaust system **(col. 8, lines 22-24, teaches channel 15 arranged on the inside of the container is to permit the passage of a partial amount of the hot exhaust gases flowing through the sound attenuator);** and,

wherein the first number of attenuating devices and the second number of attenuating elements are determined and arranged in the exhaust system **(col. 8, lines 22-24, teaches channel 15 arranged on the inside of the container is to permit the passage of a partial amount of the hot exhaust gases flowing through the sound attenuator).**

Li and Johansson et al are analogous art because they are from similar field of endeavor of sound reduction in a transport system. At the time of the invention it would have been obvious to

person of ordinary skill in the art to utilize the attributes of the transport system for gas composed of resistive and reactive attenuators discussed by Johansson in the independent component analysis model discussed by Li for the purpose of producing a transport system for gas from which the sound emission is less than from conventionally known systems **(Johansson et al: col. 3, lines 35-37)**.

Li and Johansson do not expressly disclose a measured noise level at an outlet of the channel is attenuated below a predetermined noise level; and estimating sound pressure level at a location of a exhaust system is attenuated below the predetermined attenuation level.

Galaitsis, however, discloses a measured noise level at an outlet of the channel is attenuated below a predetermined noise level **(col. 4, lines 4-9 and col. 5, lines 56-65, teaches noise from the engine are selectively accumulated and confined in at least one accumulator, for a time sufficient to attenuate the exhaust noise by ringdown. Galaitsis teaches "ringdown" means the process by which noise (acoustic energy) effectively confined within a defined volume, such as an accumulator, naturally decays over time. Col. 6, lines 58-61, teaches most preferably $T_{ringdown}$ is sufficient to substantially eliminate the noise by ringdown.)**; and estimating sound pressure level at a location of an exhaust system is attenuated below the predetermined attenuation level **(col. 5, line 66 to col. 6, line 8, teaches "minimum ring down time", means he minimum time required for noise effectively confined in a defined volume such as an accumulator, to decay by a desired amount through ringdown.)**.

Li, Johansson, and Galaitsis are analogous art because they are from similar field of endeavor of sound reduction in a transport system. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the attributes of the transport system for gas

composed of resistive and reactive attenuators discussed by Johansson with the principle of arranging attenuator to achieve ringdown as discussed by Galaitsis in combination with the independent component analysis model discussed by for the purpose of analyzing an improved system for attenuating noise where the length of time the sound waves take to propagate through the length of the transmittance path is not a factor **(Galaitsis: col. 2, lines 37-46)**.

Response to Arguments

7. Applicant's arguments filed 07/30/2010 have been fully considered but they are not persuasive.
8. Applicant's amendments to claims are sufficient to overcome claim objections. Accordingly, the objections are withdrawn.
9. Applicant's amendments to claims are sufficient to overcome 35 U.S.C § 101 rejections. Accordingly, the rejection is withdrawn.
10. Applicant's amendments to claims are sufficient to overcome previously presented 35 U.S.C § 112 rejections. However, additional 35 U.S.C § 112 issues were identified in amended claims as noted above.
11. **Applicant Argues:**

    Li and Johansson do not disclose amended feature of "the sound pressure level of the high power combustion engine is attenuated below a predetermined level".

12. **Examiner Response:**

    Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Havan whose telephone number is (571) 270-7864. The examiner can normally be reached on Monday thru Friday, 9am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the

Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/H. H./

Examiner, Art Unit 2128

/Hugh Jones/

Primary Examiner, Art Unit 2128